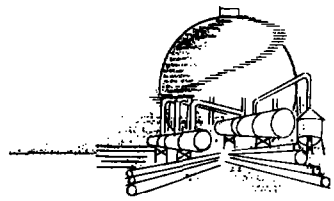

PROCESS ECONOMICS PROGRAM

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Abstract

Process Economics Program Report No. 171

PESTICIDES AND INTERMEDIATES

(December 1983)

Pesticides manufacture has grown to a multibillion dollar international business (1980 free world value of $10 billion). Herbicides account for slightly more than one-half of the total business. Insecticides account for one-third, and fungicides account for the remainder. Since few pesticide manufacturers are integrated backward to their raw materials, there is also a very significant business in supplying intermediate materials to pesticide manufacturers. Typically, pesticide intermediates are produced in relatively small volumes, often for use in the production of several pesticides or in the manufacture of dyestuffs, pharmaceuticals, and fine and specialty chemicals.

For this first PEP report on pesticides, we evaluated the technology and cost of making three preemergence herbicides of significant commercial value--alachlor, butachlor, and trifluralin. Patents covering the composition and use of these herbicides will expire within a few years.

SRI also evaluated the intermediates for the three selected pesticides so that the cost of making them from commonly available raw materials can be determined. 2,6-Diethylaniline, chloroacetic acid, and chloroacetyl chloride were evaluated for use in alachlor and butachlor manufacture. 4-Chlorobenzotrifluoride, p-chlorotoluene, and di-n-propylamine were evaluated for use in making trifluralin.

Our evaluations indicate that raw material costs constitute 60 to 70% of the herbicide production cost when the raw materials are charged in at typical contract prices. Significant savings are possible if pesticide manufacturers integrate backward into intermediate production. The economic data in this report make it possible to determine the optimum degree of intermediate integration in the production of these herbicides.

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Report No. 171

PESTICIDES AND INTERMEDIATES

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PROCESS ECONOMICS PROGRAM

Menlo Park, California 94025

For detailed marketing data and information, the reader is referred to one of the SRI programs specializing in marketing research. The CHEMICAL ECONOMICS HANDBOOK Program covers most major chemicals and chemical products produced in the United States and the WORLD PETROCHEMICALS Program covers major hydrocarbons and their derivatives on a worldwide basis. In addition, the SRI DIRECTORY OF CHEMICAL PRODUCERS services provide detailed lists of chemical producers by company, product, and plant for the United States and Western Europe.

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